DOCUMENT RESUME

ED 161 746 SE 025 214

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TITLE The Current State of Secondary School Marine Science Education in the United States.
PUB DATE 78
NOTE 10p.

EDRS PRICE MF-$0.83 HC-$1.67 Plus Postage.
DESCRIPTORS Educational Research; Enrollment Trends; *Marine Biology; *National Surveys; *Oceanology; *Science Education; *Secondary Education; Secondary School Science; Surveys
IDENTIFIERS Research Reports

ABSTRACT

Information was requested in late 1976 and early 1977 from the Departments of Education of each of the 50 states and Puerto Rico on the current status of secondary school marine science education. Thirty-five states and Puerto Rico responded. Some of the results are as follows: (1) Marine science assignments accounted for 1.94% of the total number of secondary school science teachers; (2) There were 1,591 teachers teaching marine science courses, an increase of 1,236 over the number reported in 1973; (3) Nationwide, 48 schools offered marine science instruction with 442 classes and an enrollment of 13,696 students; and (4) Dramatic increases in marine science education were noted in seven states. (BB)

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THE CURRENT STATE OF SECONDARY SCHOOL MARINE SCIENCE EDUCATION IN THE UNITED STATES

By

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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INTRODUCTION

In these years of declining interest in the status and study of science, it is satisfying to note that a growing emphasis is being placed upon the study of marine sciences at the precollege level (Schlenker 1976, Schweitzer 1973). Perhaps the increased interest is due to society's exploration and exploitation of the vast marine food potential in an attempt to adequately feed an ever increasing world population. However, it may be the result of mans' interest in mining rare metals from the sea or prospecting on the sea floor for oil. On the other hand, perhaps it is to satisfy the human thirst for knowledge. Whatever the motive, increasing interest is evident. Since recent documents pointed to an increasing interest in offering marine science instruction at the precollege level, it was decided to examine the state of the art nationally.

METHODS

A letter was sent to each of the 50 state and Puerto Rico Departments of Education in late 1976 and early 1977 requesting the following information, (1) the number of secondary science teachers in the state, (2) the number of marine science teachers in the state teaching at the secondary level, (3) the number of schools in the state or territory having marine science programs at the secondary level, (4) the number of marine science classes being conducted in the state or territory, (5) the number of

students enrolled in marine science classes at the secondary level in the state or territory, (6) if the state or territory issued a curriculum guide in the marine sciences.

RESULTS

Thirty-five states and one territory responded to the query. The data provided by the respondents has been tabulated in Table 1.

INSERT TABLE 1 ABOUT HERE

The numbers appearing within the parentheses in Table 1 are from Schweitzer (1973) and are included for comparison with those of this investigation. Definitions of the codes NK, NR, NS, NG, T, * and ** have been provided at the bottom of Table 1.

Generally, there was an increase in numbers of students involved in the marine sciences in 1976-77 over those found by Schweitzer (1973) (see Table 1).

DISCUSSION

The discussion of these data and their interpretations are only suggestive of an emerging trend. Therefore, caution should be exercised when using the results of the investigation. By no means do the authors claim them to be exact and statistically accurate. Further, the reason for this caution is the inadequacy of available information.

It was noted that of 81,990 secondary school science teachers some 1,591 (an increase of 1,236 over the number reported by Schweitzer in 1973) were teaching marine science courses. They made up 1.94% of the total number of secondary school science teachers reported. Nationwide, 48 schools offered marine science instruction with 442 marine science classes and an enrollment of 13,696 students. At the time of the study, most State Departments of Education did not issue curriculum guides of any kind, not to mention a marine science curriculum guide. Only Florida, New York and Texas provided their schools some sort of guide in the marine sciences. However, it should be noted that traditionally the development of specific curricula has been regarded as a local responsibility in all states.

One or more school systems in every coastal state reported either be Schweitzer (1973) or these authors recorded the existence of either marine science certified teachers or the existence of marine science instruction. In addition, five non-coastal states reported similar information. Thus 60% of the 35 states and Puerto Rico discussed herein had, in 1973 or did have at the time of this investigation, some vested interest in marine science at the secondary level.

A dramitic increase was seen in some states between the numbers of marine science teachers reported in 1973 and those reported in late 1976 and early 1977. While these

differences may reflect the methods by which the data were gathered in the two studies it seems doubtful the breadth of increases could be as great without reflecting a real trend. Specifically, Pennsylvania showed a 1976 over 1973 increase of 9460%, followed by a 6775% increase in North Carolina, 1450% in Virginia, 253% in Texas and 145.8% in Florida. It should be noted that in 1973 Florida already had 83 marine scinece teachers whereas Pennsylvania, North Carolina, Virginia and Texas had 5, 8, 2 and 17 respectively (Table 1). From this it seems evident that Pennsylvania's, North Carolina's, Virginia's and Texas' precollege marine science teaching interests are of more recent vintage than that of Florida's (excluding a control for teacher population). It is also significant to note Pennsylvania is a non-coastal state, perhaps an indication of a rising interest in marine sciences on the part of such states (Table 2).

INSERT TABLE 2 ABOUT HERE

Numerical data on 1973 and 1976 marine science enrollments were reported only by Florida and Mississippi. While in Florida the enrollments in 1976 increased 146.90% over 1973, the increase in Mississippi was 154.10% (Table 2).

The numbers of marine science classes in Virginia in 1976 showed a 966.70% increase over 1973; in Florida the increase was 88.40%. The numbers of schools in

Mississippi offering marine science instruction in 1976 increased 166.70% and in Washington the increase was 170.00%. Data for making these comparisons within other states were not reported (Tables 1 & 2).

CONCLUSIONS

Evaluation of the available information and data suggests the existence of considerable precollege marine science activity in 1973 (Table 1, Schweitzer 1973). When compared with available data on 1976 dramatic increases were noted (Table 2). While these increases in seven states cannot be generalized over the 50 states and Puerto Rico, they suggest an increasing interest in and awareness of marine science education.

If sound administrative policy decisions are to be made on the future of marine science instruction at the precollege level, it is recommended that more complete surveys be taken. In this way the trends may be evaluated statistically before such policy decisions are finalized.

REFERENCES

Schlenker, R. M. Precollege marine science education 1973 through 1976. U.S. Office of Education, ERIC ED 129 581, 1977.

Schweitzer, J. P. Directory of marine science education. U.S. Office of Education, ERIC ED 093 615, 1973.

Table 1

Numbers of Science Teachers, Marine Science Teachers, Schools Having Marine Science Programs and Classes, Students Studying Marine Science and States Having Marine Science Curriculum Guides in the U.S. (1976)

State Responding	No. of Sec. Schl. Sci. Teachers	No. of M. Sci. Teachers in The State	No. of Schls. With M. Sci. Programs	No. of M. Sci. Classes	No. of Students Taking M. Sci.	State Curr. Guide
*Alaska	NK	NR (2)	NR (2)	NR (6)	NR (10)	NR
Arizona	NK	NK	NK	NK	NK	NS
*California	NR	NR (39)	NR (33)	NR (83)	NR (2805)	NR
Colorado	2609	00 (1)	00 (1)	00 (1)	00 (36)	NG
*Florida	NR	204 (83)	NR (&1)	410 (207)	11278 (4568)	Yes
*Georgia	2000	NR (2)	Few (2)	NR (9)	NR (270)	NS
Idaho	NR	00	00	00	00	NG
Illinois**	3000	NK (1)	NK (1)	NK (5)	NK (240)	NR
Iowa	2800	NK	NK	NK	NK	NS
Kansas	NR	NR	NR	NR	NR	NR
Kentucky	NR	NR	NR	NR	NR	NR
*Maryland	NR	NR (6)	NR (6)	NR (8)	NR (250)	NG
*Massachusetts	3204	NK (35)	NK (31)	NK (80)	NK (1937)	NS
Michigan	5000	NR	NR	NR	NR	NG
Minnesota**	2500	NR (1)	1% T (1)	NR (5)	NK (60)	NG
*Mississippi	938	NR (3)	8 (3)	NR (7)	498 (196)	NS
Montana	627	NR	NR	NR	NR	NG
*New Jersey	NK	NR (2)	NK	NR (6)	NR (140)	NG
New Mexico**	750	2	NK	NK	NK	NG
*New York	13025	NR (23)	NR (14)	NR (49)	NR (1694)	Yes
*North Carolina	5500	550 (8)	NR (6)	NR (7)	NR (364)	NS
North Dakota	576	NR	NK	NR	NR	NS
Ohio	NK	NR	NR	NR	NR	NS
Oklahoma	NR	NR	NR	NR	NK	NS
Pennsylvania**	6827	478 (5)	NK (3)	NR (7)	NK (175)	NS
Puerto Rico	1500	00	NR	NR	NR	NS
*Rhode Island	NK	NK (10)	NK (7)	NK (42)	NK (680)	NS
*South Carolina	3075	NK (3)	NK	NK	NK	NS
South Dakota	NR	00	00	00	00	NS
Tennessee	3000	NK	NK	NK	NK	NS
*Texas	9000	60 (17)	NK (16)	NK (33)	NK (944)	Yes
Utah	750	NK	NK	NK	NK	NG
Vermont	393	4	NK	NK	NK	NS
*Virginia	12772	31 (2)	13	32 (3)	991	NS
*Washington	1837	NK (12)	27 (10)	NK (38)	NK (967)	NK
Wyoming	NK	266	00	00	00	NG

The following codes follow and belong directly under Table 1.

NK = Not Known; NR = No Response; NS = No Specific Guide; NG = No Guides at All; T = Total; * = Coastal State with Marine Science Programs; ** = Non-coastal State with Marine Science Programs; Numbers in Parentheses are from Schweitzer (1973)

Table 2

Percent Increases in Marine Science Activity in the U.S.: 1973-1976

State	% Increase in M. Sci. Teachers	% Increase in Schls. with M. Sci. Pgms.	% Increase in M. Sci. Classes	% Increase in M. Sci. Students
Florida	145.80		88.40	146.90
Mississippi		166.70		154.10
North Carolina	6775.00			
Pennsylvania	9460.00			
Texas	253.00			
Virginia	1450.00		966.70	
Washington		170.00		